

Psychological Monographs

General and Applied

No. 591
1964

Fisher

Sex Differences in Body Perception

By

Seymour Fisher

Upstate Medical Center, State University of New York

Price \$1.00

Vol. 78
No. 14

Ψ

Edited by Gregory A. Kimble
Published by the American Psychological Association, Inc.

Psychological Monographs:

General and Applied

Combining the *Applied Psychology Monographs* and the *Archives of Psychology*
with the *Psychological Monographs*

GREGORY A. KIMBLE, Editor

Department of Psychology, Duke University

Durham, North Carolina 27708

Consulting Editors

ANNE ANASTASI
Fordham University

FRED ATTNEAVE
University of Oregon

HAROLD P. BECHTOLDT
State University of Iowa

C. ALAN BONEAU
Duke University

DONN BYRNE
University of Texas

W. GRANT DAHLSTROM
University of North Carolina

WILLIAM N. DEMBER
University of Cincinnati

CHARLES W. ERIKSEN
University of Illinois

NORMAN GARMEZY
University of Minnesota

HAROLD GERARD
*University of California,
Riverside*

HENRY F. KAISER
University of Illinois

WILLIAM KESSEN
Yale University

GARDNER LINDZEY
University of Minnesota

JANE LOEVINGER
Washington University, St. Louis

BOYD MCCANDLESS
Indiana University

QUINN McNEMAR
Stanford University

GEORGE MANDLER
University of Toronto

OSCAR A. PARSONS
*University of Oklahoma Medical
Center*

DAVID SHAKOW
National Institute of Mental Health

CHARLES D. SPIELBERGER
Vanderbilt University

Manuscripts and correspondence on editorial matters should be sent to the Editor. *Psychological Monographs* publishes comprehensive experimental investigations and other psychological studies which do not lend themselves to adequate presentation as journal articles. Major space is given to the author's original contribution; introductory and bibliographic materials, as well as statistical tables and graphs, must be kept within reasonable bounds. Tables, graphs, and appendix materials which deal with detail not essential to adequate presentation of the findings may be made available through the American Documentation Institute—for details of this procedure, see the *APA Publication Manual*. Preparation of manuscripts for publication as monographs should follow the procedure given in the *APA Publication Manual*. Publication in *Psychological Monographs* is free of cost to the author, except in cases where early publication is requested or author's alterations are made in galley proofs.

The following policies govern reprinting of materials copyrighted in APA journals: (a) to require approval to reprint for tables and figures, and for text only if more than 500 words [total from one article] in length; (b) to continue approval to reprint, contingent on the author's approval, for articles reprinted in whole or in major part; (c) to negotiate where possible the dedication of royalties from commercial publishers to the American Psychological Foundation.

Manuscripts must be accompanied by an abstract of 100-120 words typed on a separate sheet of paper. The abstract should conform to the style of *Psychological Abstracts*. Detailed instructions for the preparation of abstracts appeared in the *American Psychologist* (1961, 16, 833), or they may be obtained from the Editor or from the APA Central Office.

HELEN ORR
Managing Editor

JOYCE J. CARTER
Editorial Assistant

Correspondence on business matters should be addressed to the American Psychological Association, Inc., 1200 Seventeenth St., N. W., Washington, D. C. 20036. Address changes must arrive by the tenth of the month to take effect the following month. Undelivered copies resulting from address changes will not be replaced; subscribers should notify the post office that they will guarantee third-class forwarding postage.

Psychological Monographs: General and Applied

SEX DIFFERENCES IN BODY PERCEPTION¹

SEYMOUR FISHER

Upstate Medical Center, State University of New York, Syracuse

A series of studies was undertaken to ascertain whether there are sex differences in body concept and body perception which go beyond the usual phallic-nonphallic distinction. The following parameters were investigated: (a) ability to tolerate aniseikonically induced distortions in the appearance of one's legs, (b) definiteness of one's body image boundaries, (c) the organization of body awareness, (d) accuracy of perception of alterations in the sex of one's appearance, and (e) mode of response to lens-induced alterations in the vertical and horizontal axes of one's mirror image. Multiple samples of college students were used as Ss. The results demonstrated that there are a number of significant sex differences in body image. There was also converging evidence that women may have a more clearly articulated and stable body concept than men.

DESPITE the obvious anatomical distinctions between the sexes, it has not been a simple matter to demonstrate that they differ fundamentally in the organization of the body scheme. That is, aside from the fact that the male and female have unlike body experiences related to their anatomical and body function differences we do not have empirical evidence that their body concepts are distinguished in a more generalized psychological sense. There have been various psychoanalytic speculations concerning this matter. Freud (1938, 1959), for example, suggested that the male with his externally exposed genitals is particularly likely to experience castration anxiety; and he assigned considerable importance to this fact in his explanation of how the Oedipus complex is resolved. Similarly, Freud underscored the fact that the female lacks an externally projecting genital and that the vagina, because it is literally a break in the body wall, lends itself to fantasies that a previously projecting genital has been removed. He theorized that this sense of loss may take the form of penis envy and compensatory attempts to behave in a phallic fashion. Eriksen (1951) reported that when male and female adolescents

were asked to construct scenes with play materials, the males tended to fashion upright, phallic structures and the females to depict configurations which are open and easy to enter. He proposed that these differences were actually symbolic expressions of the genital differentiation between the sexes and their contrasting modes of experiencing their bodies. Franck and Rosen (1949) found, in the same vein, that when males and females were asked to complete a series of vague line drawings, the males were typified by completions with projecting phallic qualities. This was interpreted, at least partially, as an expression of sex differences in body feeling.

All of the speculations and reports cited above share the generalization that the male and female are distinguished by body attitudes which are specifically a function of the phallic-nonphallic factor. However, there have also been other lines of inquiry about sex differences in body attitude which should be enumerated. Katcher and Levin (1955) reported that when boys and girls were asked to construct a series of human forms representing self, mother, and father by means of schematic body parts differing in size, the girls seem to have an earlier realistic appreciation than boys of the smallness of their own bodies in relation to those of adults. It was speculated

¹This study was partially supported by United States Public Health Service Grant M05761.

that since body smallness is a characteristic associated with femininity in our culture, this difference might indicate that girls learn more quickly than boys to assign sexual characteristics to their bodies. Somewhat relatedly, Jourard and Secord (1955) observed that adult women differ from men in preferring their body proportions to be small rather than large. Finally several studies should be mentioned which suggest that women may generally have greater awareness of their bodies than do men. Secord (1953) and also Weinberg (1960) reported that when associations to homonyms with body and nonbody meanings were obtained, women gave more body oriented responses than did men. Van Lennep (1957) has similarly noted that in Thematic-Apperception-Test-type stories females exceed males in number of references to body sensations and feelings.

One can see that the body scheme differentiation between males and females may not be entirely (or perhaps even primarily) a function of the phallic-nonphallic dimension. Indeed, it is probable that it does involve more generalized variables like feelings about body size and overall awareness of one's body.

The present project was concerned with uncovering the extent of sex differences in body image that do not have direct phallic-nonphallic connotations. It was the objective to explore such differences from several perspectives not primarily derived from the simple fact of unlike anatomy and body function, but rather related to contrasts between the male and the female in their style of life and role in the culture. While the studies to be described are diverse, they are unified by the intent to ascertain promising dimensions of sex differences in body concept. To demonstrate meaningful sex differences in body perception is a necessary preliminary to more systematic ventures in this area. The specific body image dimensions chosen for consideration were those for which there were already initial data suggestive of sex differences.

An important secondary goal of the project was to examine critically assump-

tions which have been made that women are less satisfied with their bodies than men and also less able to arrive at an articulated, realistic body concept. These assumptions have been fostered not only by stereotypes concerning male superiority, but also the extensive theorizing of Freud and other psychoanalysts who have emphasized that the female is severely handicapped in forming an adequate body concept by the inferiority feelings related to her lack of a penis.

STUDY 1

Aniseikonic Perception of One's Legs

This first study was partially suggested by the work of Wittreich and Grace (1955). They compared male and female subjects of varying ages with respect to the changes they reported in their own appearance while observing their mirror images through aniseikonic lenses.² Their data indicated a trend for girls to report, among other things, fewer changes in their legs and feet than was true for boys. It has been shown in several studies that perceptual targets which arouse anxiety or disturbance in an individual are those which he is least likely to see as changed when viewing them through aniseikonic lenses. Perception of change in the appearance of an aniseikonically viewed stimulus seems to be facilitated if that stimulus is experienced as nonthreatening (Wittreich & Radcliffe, 1955). With this perspective, Wittreich and Grace (1955) explained the sex differences they observed in frequency of aniseikonic change in one's own body parts as a function of differential anxiety about such parts. In discussing their data, they particularly focused upon the relative infrequency with which girls perceived changes in their legs as compared to boys and theorized that this was due to the difference in meaning attached to their legs. As they conceptualized it, the boy experiences his legs primarily as a means

² It should be indicated that aniseikonic lenses result in the image of an object which is formed in one eye differing in size and shape from the image of the same object formed in the other eye.

of locomotion and is frequently able to test out their effectiveness in this respect. Therefore, he has no special anxiety or uncertainty about them. However, they note that for the girl her legs are not only a means of locomotion but also important objects of display that evoke reactions from others which affect her judgment of whether she is attractive. Presumably, then, she would be somewhat dependent upon the opinions of others for arriving at an evaluation of her legs. In that sense, her perception of her legs would be marked by relative uncertainty and anxiety. This explanation was quite speculatively offered by Wittreich and Grace to illustrate the sort of variable that might cause a specific body area to be resistive to perceptual alteration. What is of special pertinence to the present study is their observation that females are more resistive than males to seeing changes in their legs. Subsequent to this work two papers appeared which further suggested that males and females differ in their attitudes toward their legs. Bennett (1960) reported that when subjects were asked to list any 10 body parts, men more often mentioned the leg region (in terms of reference to the knee) than did women. Calden, Lundy, and Schlafer (1959) noted that when male and female college students rated their degree of satisfaction with various parts of their bodies, the women were significantly more critical of their legs and the lower sectors of their bodies than were the men. When the Wittreich and Grace; Bennett; and Calden, Lundy, and Schlafer studies are considered together they imply that men are less dissatisfied with their legs than women and also more freely aware of them and better able to tolerate their perceptual alteration.

With this perspective, it seemed promising to theorize that males and females do differ fundamentally in the way they experience their legs. However, the Wittreich and Grace view that this difference in attitude is due to the girl's special dependence upon the reactions of others for arriving at an evaluation of her own legs did not seem to be a sufficient explanation. Thus, one could argue that the boy too is

dependent upon the responses of others in arriving at attitudes toward his legs. This dependence would not be so much in terms of reactions to the appearance of his legs as with reference to the degree of agility and skill he shows when performing in games or other athletic-type activities. The boy does not abstractly know that he is skillful in movement. He needs the positive response of others to establish that such is true. What will be suggested here is that the difference between the sexes in attitudes toward one's legs is an expression of contrasting attitudes toward mobility and movement in space. The role of the female is typically defined as less mobile and more "stay put" than is the role of the male. The male is encouraged to learn to move his body aggressively and to venture forth without anxiety. Contrastingly, it is the custom to be more protective of the female as she moves out from the family circle. She is given the feeling that it is less acceptable and more dangerous for a woman to move about freely "out there" than it is for a man. Talcott Parsons (Parsons & Bales, 1955) and others have described in detail the division of labor between the sexes, such that the female's prime duties are within the family group and the male's involve making contact for the family with outside agents and institutions. In short, socialization experiences and expectations make the female feel insecure about the type of mobility and movement which are equated with leg activity; whereas the male is encouraged to regard such mobility as a normal part of his life. It is this fact which will be tentatively singled out as most important in accounting for sex differences in leg attitudes which have been observed.

The primary purpose of the present study was to attempt to replicate with adult subjects the sex differences in aniseikonic perception of the legs which Wittreich and Grace reported for children. Such a replication would solidly establish that a basic sex difference in leg perception exists not only in children but also in adults.

A second prime objective was set which was dependent upon the results obtained

with the aniseikonic procedure. It was reasoned that if it could be shown that women do, indeed, feel more insecure than men about using their legs in an active motoric fashion it should be possible to demonstrate that their legs are less physiologically activated than are those of men. This proposition is a logical derivative of previous work in which it has been demonstrated that specific attitudes toward given body areas may be accompanied by particular levels of physiological activation of those areas. Such correlates have been shown for exterior versus interior, right versus left, and front versus back body sectors (Davis, 1960; Fisher, 1958, 1961b, 1963; Fisher & Cleveland, 1958; Shipman, Oken, Grinker, Goldstein, & Heath, in press).

Procedure

Aniseikonic judgments were obtained by asking each subject to stand 48 inches from a full-length mirror and to examine his image while wearing a set of aniseikonic lenses (right eye 4% meridional afocal, X 135°; left eye 4% meridional afocal, X 45°). He was simply told to note any changes in his appearance that might be produced by the

lenses. After he had had 5 minutes to observe himself he was told,

I will read you a list of body areas. As I mention each one, tell me if it was changed in any way by the glasses.

The following list of body areas was then read to the subject: face, shoulders, chest, arms, hips, legs.

Subjects

Two separate samples were evaluated. One consisted of 80 subjects (30 men, 50 women); and the other of 63 subjects (30 men, 33 women). They were all college students recruited by payment of a fee. The median age in both groups was 21.

Results

Sample 1. As shown in Table 1, the male and female subjects in Sample 1 are differentiated in the same fashion as the boys and girls in the Wittreich and Grace sample. There is a significant trend for the men to exceed the women in perceiving aniseikonically induced changes in their legs ($\chi^2 = 4.8$, $p < .02$, one-tailed test). None of the sex differences for the other body parts are significant, although there is a borderline tendency for women to perceive more changes in the face ($\chi^2 = 3.5$, $p < .10$, two-tailed test) and in the chest

TABLE 1
ANISEIKONIC CHANGES IN BODY APPEARANCE REPORTED BY MEN AND WOMEN
IN TWO SAMPLES

Body part	Change ^a	Sample 1			Sample 2		
		Male	Female	χ^2	Male	Female	χ^2
Face	Yes	14	34	3.5	14	25	5.4 ^{b*}
	No	16	16		16	8	
Shoulders	Yes	14	18		18	14	1.7
	No	16	32		12	19	
Chest	Yes	12	30	3.1	14	15	
	No	18	20		16	18	
Arms	Yes	13	23		20	21	
	No	17	27		10	12	
Hips	Yes	14	20		18	16	
	No	16	30		12	17	
Legs	Yes	23	26	4.8 ^{c*}	25	17	7.2 ^{**}
	No	7	24		5	16	

^a Yes = change seen; No = change not seen.

^b Two-tailed test.

^c One-tailed test.

* $p < .02$.

** $p < .01$.

($\chi^2 = 3.1$, $p < .10$, two-tailed test) than the men. No differences of consequence are present for shoulders, arms, or hips.

Sample 2. The results for Sample 2 even more forcefully indicate that men perceive aniseikonic changes in the leg area with greater frequency than do women. Table 1 indicates that the difference is significant at the .01 level. It is parenthetically interesting that the trend noted in Sample 1 for women to exceed men in frequency of perceived change in the face is clearly supported ($\chi^2 = 5.4$, $p = .02$, two-tailed test). None of the other body sectors were differentiated in more than a chance fashion for the two sexes.

Discussion of Results

The data demonstrate with clarity that men are more receptive than women to the perception of aniseikonic induced perceptual changes in the leg area. It is also noteworthy that the men did not exceed the women in aniseikonic change for any other body region. When one considers that a difference in leg perception was also found by Wittreich and Grace to hold true for children, there can be no question regarding the generality of this phenomenon. It would appear that there is a basic difference between the male and female in our culture in their ability to experience perceptual change in the legs, and it extends into the early years. In terms of the available research regarding the factors underlying aniseikonic change this strongly suggests that the female finds her legs as perceptual targets to be a source of anxiety. She is not sufficiently secure about them to take a chance on their visual transformation. It has already been conjectured that her anxiety stems from the fact that she has learned that mobility and movement in space, which are closely associated with the legs, are unsafe for a female. In that sense her anxiety would be a reflection of the limitations conventionally placed upon the female role.

It was of interest that the only other consistent aniseikonic difference which could be detected in both samples was a trend for women to perceive alterations in the

face region more readily than did the men. Parenthetically, one cannot but be struck with the fact that this difference which portrays the women as most receptive to the perceptual alteration, involves a sector which is at the extreme opposite end of the body from the legs. In any case, if one considers that the face is the area most consistently used to register expressive emotion, this finding is congruent with Parsons' (Parsons & Bales, 1955) statement that women are more specialized as expressive rather than instrumental agents in intimate situations (e.g., within the family) than are men. Can it be that the woman is more skilled in the use of her face for expressive communication and therefore more confident and less anxious or defensive about its functioning?

The data with regard to the legs was sufficiently promising to encourage an investigation of whether there are sex differences in degree of activation of the leg region. It is this matter which is explored in the next project to be described.

STUDY 2

Skin Resistance Reactivity Ratios

As previously indicated, there are findings in the literature which suggest that attitudes toward specific body areas may have their physiological correlates. For example, it has been shown in a series of studies that the more definite and clearly articulated an individual's body image boundaries the greater is his tendency to show high reactivity in the boundary regions of the body (viz., skin and muscle) and low reactivity in interior sectors, e.g., heart (Davis, 1960; Fisher, 1963; Fisher & Cleveland, 1958; Shipman et al., in press). Relatedly, ratios of skin resistance between certain body areas have proven to be related to differential values assigned to these areas. A typical pattern has been to find that a body sector given relatively lower prominence than another in the body scheme is also characterized by relatively lower skin activation. Thus, it has been demonstrated that the perception of one's head as small in relation to one's body is

correlated with a high skin resistance level on the head (i.e., low activation) as compared to the body. Differences in size ascribed to the back versus front and upper versus lower areas of one's body have been analogously correlated with skin resistance differentials (Fisher, 1958, 1961a, 1961b).

It was this background of work which suggested that if men and women differ in the apparent role they assign to their legs in the body scheme, there should also be a corresponding physiological activation difference. It was reasoned that the female is anxious about the mobility functions of her legs and conflicted about how to integrate them into her body scheme. As symbols of a potentially dangerous kind of activity, she is inclined to minimize their significance in comparison to other body areas. If this be so, it would follow that the degree of activation of the woman's legs should be less in relation to her other body regions than is true for men. It was therefore predicted that the ratio of leg skin resistance to that of an upper nonleg area should demonstrate lower leg activation for the female than the male. Also, since Wittreich and Grace had found aniseikonic leg perception differences in children, it was anticipated that the same activation sex difference would be observed in children.

Procedure

Skin resistance was used as the index of relative physiological reactivity of upper body site in relation to lower body site. It was measured by means of a Brush direct-writing oscillograph. There was a constant current supply of 20 milliamperes and a direct current amplifier for measur-

ing the voltage across subject. Calibration of the record was made directly in ohms. Separate balanced systems were utilized for the upper and the lower site measures. The area of recording from the sites was equalized by means of pieces of tape punched with two holes, each of $\frac{1}{4}$ -inch diameter.

The period of recording was based on the time required for both sites to stabilize to a point of no change for a 15-second period. A minimum of 30 seconds of recording was taken in any case. The median length of recording was 204 seconds. The upper site recording was taken from the dorsal surface of the middle joint of the middle finger of the left hand. A lower site recording was taken from a point $\frac{1}{2}$ inch anterior to the ankle. The choice of the site was quite arbitrary and was based mainly on the ease with which electrodes could be applied. A final reactivity value was tabulated for each subject that was equal to the ratio of the hand resistance level to the lower site resistance level (hand resistance:ankle resistance) at the time of stabilization. The test-retest reliability of this procedure has been shown elsewhere to be adequate (Fisher, 1961a).

Subjects

The subjects consisted of 275 college students (120 male, 155 female). Their median age was 20. They were recruited by payment of a fee.

Included in the study were 230 children (117 boys, 113 girls). Their age range was 7-17, and they were recruited by payment of a fee.

Results

The median skin resistance ratio in the adult male group was 1/4.4 (range 2/1-1/20) and in the female group it was 1/5.5 (range 2/1-1/60). When the scores were trichotomized into as nearly equal thirds as possible, a chi-square analysis indicated that the females had a significantly higher hand to ankle ratio than the males ($\chi^2 = 7.7$, $df = 2$, $p < .02$, one-tailed test). That is, the women manifested, as predicted, a relatively lower degree of skin

TABLE 2
CHI-SQUARE ANALYSIS OF ADULT SEX DIFFERENCES IN RATIO OF HAND
TO ANKLE SKIN RESISTANCE

Sex	Hand-leg ratio		
	High	Medium	Low
	$\frac{1}{(8.1 \text{ or higher})}$	$\frac{1}{(3.4-8.0)}$	$\frac{1}{(3.3 \text{ or less})}$
Men	25	49	47
Women	54	58	43

Note. — $\chi^2 = 7.7$, $df = 2$, $p < .02$, one-tailed test.

TABLE 3
MEDIAN AND RANGES OF HAND TO ANKLE SKIN RESISTANCE RATIOS IN BOYS AND
GIRLS IN AGE RANGE 7-17

	Age									
	7-8		9-10		11-12		13-14		15-17	
	M (N = 26)	F (N = 19)	M (N = 24)	F (N = 25)	M (N = 22)	F (N = 21)	M (N = 21)	F (N = 22)	M (N = 24)	F (N = 26)
Median	1 10	1 8.1	1 5.1	1 7.1	1 5.1	1 4.1	1 4.1	1 4.1	1 3.1	1 5.1
Range	2 1 1-25	1 1 1-21	1 1 1-20	1 1 1-22	2 1 1-19	3 1 1-18	2 1 1-15	1 1 1-19	3 1 1-13	2 1 1-20

Note.—M = male; F = female.

activation in the leg area (in relation to the hand) than did the men.

The medians and ranges for the children are depicted in Table 3. Because of the limited number of subjects at each level, the data have been analyzed by combining adjoining age groups (viz., 7-8, 9-10, 11-12, 13-14, 15-17). Table 4 indicates that in the 7-8 range significant sex differences do not appear. However, beginning in the 9-10 group the girls have, as predicted, a relatively lower level of leg skin activation than the boys ($\chi^2 = 4.6$, $p < .02$, one-tailed test). This difference was not evident in the 11-12 or 13-14 groups, but reappeared significantly in the 15-17 category ($\chi^2 = 3.2$, $p < .05$, one-tailed test). It is parenthetically interesting that children in the 7-8 age group have significantly less leg activation than do children 9-17 or adults.

Discussion of Results

The skin resistance data fully supported the hypothesis in the adult group, but only in a borderline fashion in the child subjects. Only at ages 9-10 and 15-17 could sex differences in ratio of hand-ankle skin resistance be detected. There is no ready explanation as to why significant differences should appear at these points, but not in the 7-8, 11-12, and 13-14 groups. Of course, the 15-17 group is closest to the adult range, and one is left with the impression that the skin resistance ratio difference is more characteristic of the adult than the child. However, the fact

TABLE 4
CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN
RATIO OF HAND TO ANKLE SKIN RESISTANCE
IN AGE RANGE 7-17

Ages	Boys	Girls	χ^2
7-8			
H	13	8	
L	13	11	
9-10			
H	9	17	4.6**
L	15	8	
11-12			
H	11	10	
L	11	11	
13-14			
H	9	10	
L	12	12	
15-17			
H	7	14	3.2a*
L	17	12	

Note.—H = above median; L = at median or below.

a One-tailed tests used.

* $p < .05$.

** $p < .02$.

that a difference also appeared as early as age 9 cannot be dismissed. Perhaps there is an early sex difference which is for a period obliterated by other developmental events and then later re-emerges.

The overall results from the aniseikonic lens procedure and the skin resistance measures point to a fundamental sex difference in the manner in which the legs are integrated into the body scheme. In turn,

this difference has been speculatively linked with attitudes toward mobility and movement in space. It is striking that a sex difference in leg skin resistance levels was predicted from the aniseikonic data, and that the prediction was generally confirmed. This adds weight to the view presented in detail elsewhere (Fisher & Cleveland, 1958) that body attitudes may play an important role in the degree of physiological activation of various body sectors.

STUDY 3

Body Boundary Differentials

This third study deals with sex differences relating to the individual's perception of his body boundaries. It has become apparent from a number of sources (Fisher & Cleveland, 1958; Schilder, 1935; Wapner, Werner, & Comalli, 1958) that persons differ in their experiencing of the boundary regions of their bodies. Some perceive these regions as definite, well articulated, and clearly separating them from their environs; whereas for others they are vaguely defined and represent only a hazy contour. In the ordinary course of events the existence of a body image boundary is not obvious for most persons seem to know well enough where they end and the outer world begins. However, there are pathological states in which loss of boundary occurs, and some of its functions then become apparent. Thus, brain pathology may so disrupt an individual's boundary awareness that when he is asked with his eyes closed to indicate a spot on his skin where he has been touched he points to a locus in space outside of his body. Wapner et al. (1958) have shown that the more articulated the boundaries of a region of an individual's body the smaller does its size appear to him; and further they have observed that when the boundary is disrupted by ingestion of LSD there is a sense of increased ("spread out") body size. Reitman and Cleveland (1964) have reported that when sensory isolation decreases input into the boundaries they become less articulated, with accompanying changes in the touch threshold of the

skin. It has been suggested too (Fisher, 1962) that loss of boundaries underlies the schizophrenic's tendency to confuse his own thought processes with outer reality, as typified in the hallucination. He apparently confuses "inner" and "outer."

Fisher and Cleveland (1958) have devised empirical indexes which are descriptive of the clarity or definiteness of the individual's body image boundary. One of the indexes is referred to as the Barrier score. It is based upon a count of the number of responses to an ink-blot series in which special protective, containing, or decorative functions are assigned to the periphery of the percept. Some examples of Barrier responses follows: cave with rocky walls, woman in a fancy costume, vase, sheepskin coat, turtle with a shell. It has been shown that the Barrier index can be scored with high objectivity; that it has adequate test-retest reliability; and that it is meaningfully linked with reported patterns of body sensation from boundary and nonboundary regions of the body (Fisher, 1963).

A second boundary index devised by Fisher and Cleveland is called the Penetration score. It is based upon a count of all responses to an ink blot series in which the boundary of the percept is somehow open, bypassed, breached, or destroyed. Some examples of penetration responses follow: X ray of body, bleeding wound, vagina, bullet entering flesh, crushed bug. It has been shown that such responses can be scored with high objectivity (Fisher, 1963).

Many studies have been reported which indicate that the Barrier and Penetration scores are predictive of important personality, physiological, and social behavioral patterns. These studies have been reviewed in detail elsewhere (Fisher, 1963). They demonstrate that the more definite an individual's boundaries the more likely he is to perceive himself as possessing clear-cut identity and to have a concept of his body as a well-differentiated sector of space equated with self.

In earlier studies involving the boundary scores it had not been evident that adult sex differences existed (Fisher & Cleveland,

1958). The only previously described sex differences involved children. It was noted that in the age range 5-7 years boys had significantly lower Barrier scores than girls. While in the age range 10-13, girls proved to have lower Barrier scores than boys. The difference observed at the 5-7 level was interpreted as paralleling other findings which pinpoint this period as one in which boys are unusually conflicted about their relationships with father and sensitive to the possibility that he might attack them. Thus, the lowered Barrier score was viewed as reflecting expectation of body damage.

There was no obvious explanation for the sex difference in Barrier scores which was observed for the 10-13 age group, except for the possibility that more girls than boys would in the 10-13 range be already fully involved in the conflicts and difficulties of adolescence. That is, because girls mature faster than boys, it was considered that a higher percentage of them in the 10-13 age class would be coming intensely to grips with adolescent body and role changes and therefore experience an unusual degree of body-focused anxiety (Fisher & Cleveland, 1958).

Although it had been accepted on the basis of earlier studies that there were no adult sex differences in boundary definiteness, hints began to accumulate that small but consistent differences might be present when careful controls were imposed to obtain an equal number of responses from men and women with similar educational and socioeconomic backgrounds. It was the intent of the present study to examine this possibility in a large sample.

Procedure

All Barrier and Penetration scores were based on responses to the Rorschach ink blots which were shown on a screen to subjects in small groups. Response total was controlled by asking that a fixed number of percepts be given to each blot. Three responses were requested for each of cards I, II, III, VII, and X and two for each of the other five cards in the series.

Not only were Barrier and Penetration scores computed, but also an overall index of boundary definiteness which is equal to number of Barrier minus number of Penetration responses. This index

TABLE 5
CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN BOUNDARY SCORES

Boundary score	Sample		χ^2
	Men	Women	
Barrier			
H	135	184	11.5*
L	139	106	
Penetration			13.6*
H	154	118	
L	120	172	
Barrier minus Penetration			28.9*
H	110	182	
L	164	108	

Note.—H = above median; L = at median or below.

^a Two-tailed test.

* $p < .001$.

has shown itself to be a meaningful measure of boundary definiteness in several studies (e.g., Cassell & Fisher, 1963; Conquest, 1963).

Subjects

A large sample consisting of 564 subjects was assembled (274 men and 290 women). The subjects were all college students recruited either by payment of a fee or as part of a required testing program. The median age in both sex groups was 21.

Results

The median Barrier, Penetration, and Barrier minus Penetration scores in the male group were, respectively, 6 (range 0-16), 3 (range 0-12), and 2 (range from -5 to 13). The respective medians in the female group were 7 (range 1-18), 2 (range 0-12), and 4 (range from -5 to 13).

As shown in Table 5 there is a highly significant trend for males to have lower Barrier scores than females ($p < .001$ level). The men also proved to have higher Penetration scores ($p < .001$ level) and lower Barrier minus Penetration scores ($p < .001$ level) than the women. Thus, in terms of all three indexes women are portrayed as having more definite boundaries than men.

Discussion

It is not a simple matter to account for the greater degree of boundary definiteness

displayed by the females. This represents a contradiction of stereotypes which portray the male as superior to the female with regard to such variables as self-definition, clarity of body concept, and body security. A view emphasizing male superiority in this respect was especially fostered by Witkin, Lewis, Hertzman, Machover, Meissner, and Wapner (1954) who found that men were better able than women to utilize body cues in making spatial judgments, and who therefore concluded that men have a more secure and effective body concept. Actually, when one examines Witkin's work, it becomes apparent that his conclusions regarding body concept differences between the sexes are tangential deductions from the fact that women performed more poorly than men in using kinesthetic cues to make spatial judgments when they also have the choice of using visual cues for the same purpose. The fact which is usually overlooked is that when women were placed in situations in which they were forced to rely on their own kinesthetic resources, they proved to be just as accurate in their spatial judgments as men. It is not accurate to interpret Witkin's work as demonstrating that women cannot utilize body cues as efficiently as men. Interestingly, one may note further that when he analyzed sex differences in body concept as defined by figure drawing indexes he was unable to detect any superiority for the male.

Indeed, other studies have provided information which suggests not only that the female devotes more attention to her body than the male, but also that she more quickly arrives at an articulated and realistic concept of it. As already indicated, Katcher and Levin (1955) observed that girls arrive at a realistic concept of their body size at an earlier age than boys. Swenson and Newton (1955) and Wieder and Noller (1950, 1953) reported that girls seem to attain earlier than boys a sexual definition of self as measured by the frequency with which they draw a figure of the same sex as self when asked to draw a picture of a person. They noted also that girls earlier incorporated details into their drawings which clearly distinguished the

sex of the figure. Machover (1953) after analyzing the drawings of 1,000 children from ages 5-11 indicated that girls seemed to have less difficulty than boys in evolving a comfortable body concept.

It is possible, then, that the relatively greater boundary definiteness exhibited by the women in the present study represents a clearer articulation of the body concept. Perhaps women exceed men in the clarity with which they perceive their bodies as differentiated and individualized. One could argue that the culture encourages the female to be more interested in her body than it does the man. Also, her role as a woman is more explicitly identified with her body and its functioning than is true of the man. The man's role and status are typically defined in terms of his accomplishments and attainments rather than in terms of his body attributes, but for the woman her role is still largely defined in relation to the attractiveness of her body to the male and her ability to bear children. She learns rather early that her body will be her most important means for the attainment of a meaningful role. It is true that the male is given various messages about the importance of having a strong masculine body, but it becomes evident to him that his success as a man will have little to do in the long run with his body attributes. Only an athlete can see a direct equation between his body strength and success in life. A woman probably more nearly equates self with body. She has a clearer concept than a man of the role her body will play in her life. It is quite apropos to point out further that one of the prime eventual goals of most women involves the conversion of her body into a "container" or protective enclosure for the production of children. Does not the successful conceptualization of one's body as a containing, protective form necessarily mean that it must be experienced as having clear and dependable boundaries?

STUDY 4

Differential Modes of Body Awareness

It has been proposed that individuals differ in general awareness of their own

bodies. One may picture each person as distributing his attention between his body and its environs. At one pole are those who are intensely preoccupied with their own body sensations; whereas at the opposite pole are others who seem to have little awareness of their bodies. In a previous study a technique for measuring body awareness (body prominence) was described. It is based on the frequency with which an individual refers to his own body when a sample is taken of what lies within his immediate awareness (Fisher, 1964). A body prominence score derived from such a sample has been shown to have a test-retest reliability of .59 over an intervening period of 3 weeks. It has also proven to be significantly correlated with selective memory for words referring to the body (Fisher, 1964), to be enhanced by conditions which increase body sensations (e.g., ingesting a drug), and to be intensified in situations where nonbody stimulation is decreased (e.g., when isolated by oneself rather than being in a group).³

The present project represents an attempt to confirm certain exploratory observations which indicated that men and women differ with regard to the factors that contribute to the prominence of their own bodies in their perceptual fields. The specific hypothesis to be evaluated is as follows. Body awareness in a woman is positively linked with the clarity and definiteness of her body boundaries. However, body awareness in a man is not based upon the definiteness of his body boundaries. Rather, it is positively correlated with the relative salience of the gastrointestinal region in his body scheme. Broadly speaking, this hypothesis suggests that body awareness in women is a function of conditions involving the boundary regions of the body; whereas in men it reflects experiences pertaining to the digestive aspects of the body interior. This would, of course, imply that body awareness has different meaning and consequences in men than it does in women.

The exploratory study which suggested this hypothesis and the cross-validating

efforts that followed will be presented in sequence.

Study 4A

Procedure

As part of a larger project, the following three body image measures were administered to the groups of subjects:

1. **Body Prominence:** The relative prominence of the subject's body in his own perceptual field was measured in terms of what lay within his awareness at a given time. He was asked in a group situation to list on a sheet of paper "ten things that you are aware of or conscious of right now." The 10 responses given were scored by summing the number of references he made to his own body. Such body references were defined so as to include explicit body designations (e.g., "My head hurts"), temperature or kinesthetic sensations, eating experiences (e.g., "I would like to eat a piece of pie"), and descriptions of one's own clothing (e.g., "My dress is green"). Interscorer agreement for two judges for 59 protocols was 95%. The rationale for this measurement is that the greater an individual's perceptual focus upon his own body the more should his body (or appropriate equivalents) find representation in his reports regarding the content of his awareness.

In the present study body-prominence responses were sampled from each subject on three different occasions with a week intervening between the first and second and also the second and third sessions. A total score equal to the sum of the three separate scores which had been obtained was tabulated.

2. **Barrier score:** This index has been described in detail above in Study 3.

3. **Body Focus Questionnaire (BFQ):** The BFQ was developed to obtain information regarding the relative prominence of various parts of an individual's body in his body scheme. It attempts to ascertain the distribution of the individual's attention to the major aspects of his body. When BFQ is administered, the subject is presented with a list of 91 paired body areas and given the following instructions:

Turn your attention upon yourself. Below is a list in which different areas of your body are listed in pairs. In each case circle the area or part which is at the moment most clear in your awareness. In other words, circle the one which at the moment stands out in your attention.

The items included are categorized into nine body dimensions. The greater the frequency with which the items comprising a particular body dimension are selected as "Most clear in awareness" the more perceptually prominent is that dimension considered to be.

In the present instance only those 10 items will be considered that relate to a comparison of one's stomach with a series of noninternal body areas.

³ Author, unpublished data.

TABLE 6
CHI-SQUARE ANALYSIS OF RELATIONSHIP OF BARRIER SCORE TO BODY PROMINENCE
IN MALE AND FEMALE GROUPS

		Barrier score						
		Male			χ^2	Female		
		H	L	H		L	χ^2	
Body Prominence	H	11	13			16	6	9.5*
	L	14	12			5	15	

Note.—H = above median; L = at median or below.

* $p < .001$.

Subjects

The subjects were 50 male and 42 female college students who were recruited by offering them a fee. The median age in both groups was 20.

Results

The medians and ranges for the Body Prominence, Barrier, and BFQ variables were, respectively, in the male group: 7 (range 1-13), 6 (range 2-13), 5 (range 1-10). In the female group they were, respectively, 7 (range 1-14), 7 (range 2-18), 4 (range 1-10). Relationships between Body Prominence and each of the other two variables were examined by means of the chi square. As shown in Tables 6 and 7, it was found that in the female group Body Prominence was significantly and positively related to the Barrier score ($\chi^2 = 9.5, p < .01$, two-tailed test), but not to the BFQ stomach score ($\chi^2 = 1.9, p < .20$). However, in the male group Body Prominence had only a chance link with the Barrier score and a significant positive one with the BFQ stomach score ($\chi^2 = 5.9, p < .02$, two-tailed test). Thus, in the female sample body awareness seemed to be

tied in with the degree of definiteness of the body image boundary, but did not relate to the relative position of the stomach in the hierarchy of attention devoted to various body regions. The overall level of body awareness of the males appeared to be a positive correlate of the amount of attention directed to the stomach and was apparently not a function of body boundary conditions.

It was these first exploratory findings which led to the hypothesis regarding difference in the process underlying body awareness in the two sexes.

Study 4B

Procedure

The Barrier and BFQ stomach scores were secured in the same fashion as described in Study 4A. However, the Body Prominence score was obtained by asking the subject to write down 20 rather than 10 things of which he was aware or conscious.

Subjects

The experimental population consisted of 112 women and 109 men who were college students.

TABLE 7

CHI-SQUARE ANALYSIS OF RELATIONSHIP OF BODY PROMINENCE SCORE TO STOMACH AWARENESS IN MALE AND FEMALE GROUPS

		Body Prominence score						
		Male			χ^2	Female		
		H	L	H		L	χ^2	
Stomach awareness	H	16	8	5.9*		14	8	1.9*
	L	8	17			8	11	

Note.—H = above median; L = at median or below.

* Two-tailed test.

* $p < .02$.

The median age in both sex groups was 22. Some of the subjects were recruited by offering them a fee, but the majority was obtained in the course of required testing programs.

Results

The Barrier, Body Prominence, and BFQ medians in the male group were, respectively, 6 (range 0-14), 3 (range 0-10), and 5 (range 1-10). In the female group the respective medians were 7 (range 0-15), 3 (range 0-11), and 5 (range 1-10).

Once again the Body Prominence score was significantly and positively related to the Barrier score in women ($\chi^2 = 4.0$, $p = .02$, one-tailed test), but had only a chance association with the Barrier score in men.

However, while Body Prominence was, as predicted, not related to the BFQ stomach score in women, it also proved, contrary to prediction, to have only a chance relationship to BFQ stomach in men.

Study 4C

Procedure

Only the Body Prominence and BFQ scores were obtained in order to evaluate further the fact that, contrary to prediction, they were not positively related in the male group in Study 4B.

Subjects

The subjects were 34 men and 50 women who were college students. They were tested during regular psychology class sessions. The median age was 20.

Results

The median Body Prominence and BFQ scores in the male group were, respectively, 4 (range 0-8) and 5 (range 0-10). In the female group the respective values were 3 (range 1-11) and 4 (range 0-10).

The data were, in this instance, clearly supportive of the hypothesis. Thus, in the male group Body Prominence and BFQ stomach were correlated .34 (rho) which is significant at the .05 level (one-tailed test). The relationship for the females was of a chance order, as was expected.

Study 4D

Procedure

The Body Prominence, Barrier, and BFQ stomach scores were obtained by the same methods outlined in Study 2.

Subjects

Forty-nine men and 74 women participated. They were college students with a median age of 21. They were primarily recruited by testing scheduled psychology classes.

Results

The Prominence, Barrier, and BFQ scores in the male group were, respectively, as follows: 2 (range 0-9), 5 (range 2-12), and 5 (range 0-10). In the female group they were, respectively, 2 (range 0-10), 6 (range 2-15), and 5 (range 0-10).

Analysis of the data indicated that Body Prominence was positively and significantly related to the Barrier score in the female group ($\chi^2 = 5.6$, $p < .01$, one-tailed test), but not in the male group. As predicted, no relationship was found between Body Prominence and BFQ stomach for the females, but, contrary to prediction, no relationship was also found for the males.

Study 4E

Procedure

The BFQ scores were obtained in the usual fashion. However, when the Body Prominence procedure was administered, the subject was asked to give 10 rather than 20 responses.

Subjects

The subjects were 21 men and 21 women who were relatives of patients hospitalized in a psychiatric hospital. The median age in the male group was 29 years, and the average educational level 10 years. In the female group the average age was 32 years, and the average educational level 11 years.

Results

The median Body Prominence and BFQ scores in the male group were, respectively, 2 (range 0-8) and 5 (range 0-8). In the female group the respective medians were 2 (range 0-7) and 5 (range 0-9).

As predicted, no relation between the Barrier and Body Prominence scores was

found in the male sample, but a significant rho of .46 ($p < .05$, one-tailed test) was found in the female group.

Study 4F

The difficulty in obtaining consistent, predicted differences between the sexes with regard to the relationship of the BFQ stomach score to Body Prominence led to the development of another approach to this issue. It was decided to make use of selective memory for words pertaining to a given body region as an index of the prominence of that region in the body scheme. The rationale for this procedure was provided by previous studies in which it was actually shown that there is a positive relationship between the degree to which an individual directs his attention to a given region of his body and the degree to which he demonstrates selectively superior recall for references to that region when he learns a list of body terms. Thus, in one study (Fisher & Fisher, 1964) it was found that the more a subject is aware of the boundary regions (viz., skin and muscle) of his body rather than its interior sectors the more he manifests superior memory for words pertaining to body exterior sensations (e.g., skin itch, muscle ache) as contrasted to words designating interior sensations (e.g., heart beat, stomach ache). Relatedly, it was ascertained in another project (Fisher, 1964) that the greater the attention focused by an individual upon his own body in relation to other objects in his perceptual field the more he selectively recalls words with body meaning rather than words without body implications.

It was anticipated that if the hypothesis were correct that body awareness is linked to gastrointestinal sensation in men but not in women, there should be a significant positive relationship in men between body prominence and selective superior recall for body areas related to gastrointestinal functioning. However, such a relationship should not be found in women.

Procedure

Selective recall for references to gastrointestinal body areas was measured in the following fashion.

A list of 20 words pertaining to the body was compiled which follows: SPINE, THROAT, GUT, BRAIN, JOINT, STOMACH, LUNGS, SALIVA, LIVER, LIPS, MOUTH, BLOOD, KIDNEY, TONGUE, HEART, INTESTINE, GUMS, BLADDER, TEETH, SKULL. Ten of the words refer either directly or indirectly to body areas involved in the intake and digestion of food. The other 10 words designate body areas not related to such digestive processes. Both sets of words are of the same average length and randomly assigned to positions in the list. Selective recall was evaluated by telling the subjects (in groups of three to five) that they were to be shown a list of words which they were to study. The list was exposed for 1 minute and removed from view. Then a 5-minute period was provided for the subjects to write on a sheet of paper as many of the words as they could remember. The words recalled were scored by summing those with nutritive references and subtracting the sum of those without such references. Thus, the more positive the score the greater the proportion of nutritive body areas recalled.

Body Prominence was measured in the usual fashion and the subjects were instructed to give 20 responses.

Subjects

Two samples were evaluated. Sample 1 consisted of 58 men and 32 women whose median age was 20. Sample 2 was comprised of 55 men and 28 women. All subjects were college students (median age 20).

Results

In Sample 1 the median Body Prominence score for men was 3 (range 0-10) and the median memory score was 0 (range -5 thru 5). The respective medians in the female group were 3 (range 0-8) and 0 (range -3 thru 4).

The results in the male group are significantly in the expected direction ($\chi^2 = 3.2, p < .05$, one-tailed test). The greater the male subject's awareness of his body the more likely he is to show selectively superior recall for body areas involved in the nutritive-digestive process. Also, as predicted, only a chance relationship turned up in the female group between Body Prominence and oral memory.

In Sample 2 the median Body Prominence score in the male group was 3 (range 0-9) and the median oral memory score was 0 (range -4 thru 4). The respective medians in the female group were 3 (range 0-10) and 0 (range -5 thru 5).

The results for Sample 2 were of the

same order as observed in Sample 1. Thus, a rho correlation of .27 ($p < .05$, one-tailed test) was found between Body Prominence and degree of superior recall for the nutritive-digestive words. In the female group the relationship was .12, which is of a chance order.

Discussion of Overall Results

Several studies have been presented dealing with the hypothesis under consideration. That aspect of the hypothesis which states that Body Prominence is positively linked to boundary definiteness in women but not in men is well supported by the data. In four different samples this pattern of interrelationship has been significantly demonstrated. However, it has been more difficult to establish that Body Prominence in men is linked with degree of awareness of nutritive-gastrointestinal areas. While two studies indicated a significant positive link between Body Prominence and BFQ stomach in men, there were also two others in which this could not be shown. When the technique involving selective memory for nutritive-digestive terms was applied, consistent support for the hypothesis did emerge. The more a man is aware of his body the more likely he is to display selectively good recall for nutritive-digestive words. This is not true in women.

What are the prime implications of the findings? They do indicate that intensity of body awareness is founded upon different classes of variables in women and men. In women, awareness of one's body is related to the clarity of one's body boundaries. Whereas in men, a more important contribution to body awareness is made by the nutritive-digestive aspects of one's body scheme. The fact that body awareness in women is a function of boundary definiteness may be most meaningfully interpreted within the context of previous work which had dealt with boundary phenomena in terms of the Barrier score. There are considerable data which portray the person with definite body image boundaries as goal oriented, self-steering,

and possessed of an articulated sense of identity. Clear-cut boundaries seem to be accompanied by the ability to behave as a well-individuated person. From this perspective, it would appear that degree of body awareness in women, which is positively related to boundary definiteness, is an expression of individuation and differentiation. The woman who is relatively highly aware of her body may be viewed as one who expresses herself with a clear sense of self-identity. Her body awareness is perhaps one manifestation of her clear-cut differentiation from her environs. Contrastingly, the woman with relatively little body awareness may be characterized as being only a hazily defined individual.

The picture seems to be quite different for men. Body awareness is not related to boundary definiteness, but rather to the prominence of the nutritive-digestive areas in the body scheme. This means that the man who is most aware of his body is also the one who is most focused upon his stomach, gut, and related accessory sectors. Thus, a man's degree of individuation would not appear to have a part in his body awareness. It is difficult to know what specific significance to attach to the role that the gastrointestinal system seems to play in a man's level of body awareness. Most previous observations and speculations concerning gastrointestinal awareness (Blum, 1949; Fenichel, 1945; Freud, 1938) have been inclined to adopt a view which associates such awareness with oral impulses striving for expression or with traits of the "oral character." The man with high body awareness would then presumably be one who is unusually interested in incorporating things and finding adequate sources of "supplies" and gratification. This is an interesting possibility that further studies should be able to test.

It is perhaps not going too far beyond the facts to say that the data indicate that in women degree of body awareness is correlated with indicators of personal maturity (viz., individuality and self-steering). However, in men it is related to variables (i.e., oral preoccupation) which

probably have connotations of immaturity. This difference could be speculatively related to the contrasting attitudes which one finds in Western culture toward body awareness in men and women. The socialization of the female child emphasizes a conscious concern with how her body impresses others. She is expected to devote considerable attention to adorning and shaping her body to make it attractive and to communicate her sexual interests. This is a normal and an important aspect of learning the role of a woman. However, the boy, while expected to develop muscular strength and agility, is not encouraged to attend to his body in this self-conscious manner, particularly as a potential object of display and attractiveness. It is interesting in this respect that Van Lennep (1957) has found that typically girls show an increasing concern with body themes in Thematic-Apperception-Test stories as they mature beyond adolescence, whereas boys manifest a decreasing degree of such concern. Relatedly, Harlow (1951) reported that men who devoted special attention to building up their bodies by means of weight lifting were likely to be insecure and in considerable conflict about being heterosexually expressive.

STUDY 5

Response to Body Distortion

The findings from the boundary and body prominence studies implied that women have less difficulty than men in dealing with the whole problem of body awareness and arriving at a view of their bodies as distinct articulated entities. There was the implication that women have body concepts which are more closely linked to their identities and therefore more meaningful to them. Within this framework, two hypotheses were formulated which propose relatively greater stability for the female body image.

It was first hypothesized that women have a clearer concept than men of the sexual identity of their bodies. That is, they are presumed to have a clearer con-

cept of their body attributes as congruent with a specific life role. If so, it should follow that they would be less confused or disturbed than men when perceiving themselves in a situation designed to introduce ambiguity concerning the sexual attributes of their appearance.

Secondly, it was conjectured that women are more accepting than men of the immediate structure and configuration of their bodies. Therefore, it was logical to predict that they would be less likely than men to perceive gross alterations in their apparent body proportions as having positive or enhancing value. That is, women were presumed to have less need to seize upon arbitrary externally imposed changes in their body configurations as representing a shift toward some idealized standard.

Study 5A

This study was concerned with the first hypothesis regarding male-female differences in responses to alteration in the sex of one's appearance. It was considered that the more insecure an individual is about the sexual identity of his body the greater will be his anxiety and disturbance when confronted with images of himself that are ambiguous with regard to sexual categorization. If men are more insecure than women about their sexual identity, they should be characterized by signs of relatively greater anxiety when confronted by a situation which introduces contradictions regarding the sex of one's appearance.

Procedure

In order to test this formulation, each subject was asked to describe his own mirror image while wearing a series of male and female masks. The subject was brought into a totally dark room and placed 4 feet from a full-length mirror. He was told to keep his eyes closed until a signal was given. He was further told that a series of masks would be placed upon his face and that each time he was asked to open his eyes he would have a very brief glimpse of his masked appearance in a mirror. His task was to examine his image until it was no longer visible, then he was to close his eyes and describe in as much detail as possible the appearance of his masked face. The subject was given

a verbal preparatory signal ("Get ready") 1 second before he was to open his eyes and then two lights (75 watt) were turned on for 1 second by a timer. Simultaneously with the turning on of the illumination the subject was given a signal to open his eyes. Eight different rubber masks were placed upon the subject's face. Four were male and four female and were presented in random order. They were chosen so that their sex characteristics were clearly evident. When the subject described the appearance of his masked face, his words were written down as verbatim as possible.

Scoring of the subject's descriptions was entirely concerned with the correctness of his identification of the sex of each mask. The total number of misidentifications was tabulated. This total could range theoretically from 0 to 8.

It was presumed that confrontation with a situation in which the sex of one's appearance could unpredictably vary would create a threat to the subject in proportion to his own insecurity about his sex attributes. Further, it was expected that the more intense the threat to the subject the greater the likelihood that he would experience anxiety of sufficient magnitude to interfere with the accurate perception of the sex characteristics of the masks. In terms of the hypothesis, this meant that men should make more errors than women in identifying the sex attributes of the masks.

Subjects

Two separate samples of subjects were studied. Sample 1 consisted of 63 subjects (30 male, 33 female), and Sample 2 was comprised of 78 subjects (29 male, 49 female). All were college students recruited by payment of a fee. Median age in both samples was 20.

Results

Sample 1. The median number of sex misidentifications in the male group was 3 (range 0-4) and in the female group 1 (range 0-2). As shown in Table 8, a chi-square analysis confirmed the prediction that the male subjects would report a larger number of sex misidentifications than the female subjects ($\chi^2 = 25.2$, $p < .001$).

Sample 2. The median for sex misidentifications in the male group was 2 (range 1-3) and in the female group 1 (range 0-4). When the data in this cross-validation sample were examined by means of the chi square sex misidentifications proved to be significantly more frequent in the male than female groups ($\chi^2 = 7.4$, $p < .001$).

It should be noted that an analysis of the specific types of misidentification errors in Samples 1 and 2 did not reveal any significant trends for these errors to cluster on masks of the same sex or opposite sex as the subjects.

Discussion

The differentiation between the men and women in number of sex misidentification errors was surprisingly sharp in two different samples. Men seem less able than women to make valid discriminations between male and female sex attributes under the conditions set up in the present experiment. It must, of course, be acknowledged that the fact that the subjects responded to masks on their own faces does not insure that they identified them with their own appearance. The same results could perhaps have been obtained from reactions to the masks had they not been on the subject's own face. However, the fact must be considered that although a multitude of studies have been done of sex differences in responding to many kinds of pictures and blots, none have ever indicated that men are less successful than women in making valid distinctions between that which is male and female. In any case, whether the results of the present study could be duplicated with masks not worn by the subject the basic fact would

TABLE 8

CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN MISIDENTIFICATIONS OF MASKS IN SAMPLES 1 AND 2

	Sample 1			Sample 2			
	Male	Female	χ^2	Male	Female	χ^2	
Sex misidentifications	H L	27 3	9 24	25.2*	18 11	15 34	7.4*

Note.—H = above median; L = at median or below.

* $p < .001$.

remain that men evidence more disturbance than women in making the male-female discriminations required. One should also note that the relatively greater number of errors made by the men in this unstructured situation is opposite to the usual finding that women make more errors than men in vaguely defined judgmental situations (e.g., Witkin et al., 1954).

Study 5B

The hypothesis was examined that women are more accepting than men of their immediate body attributes and therefore less likely to interpret gross alterations in their appearance as representing "improvement" in the direction of some idealized standard. Stated in another way, it was expected that men would exceed women in reading desirable implications into visual transformations of their bodies. This hypothesis was derived, first of all, from the already stated view that a woman feels more secure about, and basically accepting of, her body than a man because she can more clearly relate its attributes to her primary social role. Secondly, it was considered that women devote a good deal of energy to experimenting with cosmetics and various types of clothing in an effort to arrive at a "best appearance," whereas men are restricted by custom to a minimum of such experimentation. Thus, women have a greater opportunity than men to "act out" their fantasies about how they would like to look to others. This would provide them with a more realistic experiential basis for deciding what improves their appearance. Also, it would mean that they would have fewer unexpressed impulses relating to the alteration of their appearance, and therefore would have less need to capitalize on wishful opportunities for transformation of their bodies.

Procedure

In order to provide subjects with an opportunity to react to gross alterations in their appearance they were asked to stand 4 feet from a full-length mirror and to view themselves while wearing lenses that changed their apparent proportions. One set of lenses was designed to produce obvious lengthen-

ing of the vertical axis of the body. They consisted of a pair of equivalent meridional afocal iseikonic lenses of 14% magnification (right eye and left eye—14% [M = 1.20] meridional afocal lenses at axis 180°). Their overall effect was to make the subject look taller and thinner. A second set of lenses was used which produced obvious widening in the horizontal axis. They were comprised of a pair of equivalent meridional afocal iseikonic lenses, of 14% magnification (right eye and left eye—14% [M = 1.20] meridional afocal lenses at axis 90°). Generally, they confronted the subject with an image of himself which was shorter and wider than usual.

The subject was instructed to observe his mirror image and to describe the ways in which it appeared to be altered. Upon completion of his description which was written down as verbatim as possible, he was asked to imagine the kind of person his altered appearance made him resemble. Responses were obtained first for the vertically and then for the horizontally distorting lenses.

The protocols were scored by rating the subject's description of his altered appearance as favorable or not favorable. Two judges who had no knowledge of the hypothesis under consideration attained 86% agreement in their classification of the responses for the total sample. Disagreements were later resolved by joint discussion.

Examples of responses judged as favorable are as follows: Abraham Lincoln, movie star, agile, athletic, like a model, tall and slim. The following are illustrative of responses judged as unfavorable: lazy, fat, clown, weak, old maid.

Subjects

There were 81 subjects (31 men, 50 women). They were college students whose median age was 20 years.

Results

Without exception, all subjects detected the lengthening impact of the vertical lenses and the widening effect of the horizontal lenses. However, there were many individual differences in the interpretations that were placed upon these changes. Some subjects greeted them as highly desirable ("I wish I looked like that"), whereas others rejected them as "ugly" and alien.

As can be seen in Table 9, the men were significantly more often approving than the women of the changes they observed in their mirror images. The differences were highly significant for both the vertical ($p < .001$) and horizontal ($p < .001$) conditions. It was the men who seemed to be intrigued with the potential improve-

TABLE 9

CHI-SQUARE ANALYSIS OF SEX DIFFERENCES IN RESPONSE TO VERTICAL AND HORIZONTAL LENS-INDUCED CHANGES IN MIRROR IMAGE

	Vertical			χ^2	Horizontal		
	Male	Female			Male	Female	χ^2
Favorable	19	6 ^a		20.8*	17 ^b	11	
Other	12	42			11	39	11.7*

^a Only 48 female subjects are reported because 2 did not participate in the vertical distortion task.^b Only 28 male subjects are reported because 3 did not participate in the horizontal distortion task.* $p < .001$.

ment in body form suggested by the novel mirror image. Typically, this potential improvement was defined in terms of greater strength or forcefulness.

Discussion

The sex misidentification data and the results from the lens distortion procedures were congruent with the view that women have a more clearly articulated body concept than men. The sex misidentification data are rather unequivocal. However, one could debate an alternative explanation for the lens findings. Is it possible that the women, in rejecting the lens changes, were actually evidencing anxiety about perceiving gross alterations in their appearances? Perhaps the more favorable attitude of the men toward such alterations was indicative of their ease in accommodating to them? These possibilities cannot be dismissed, but they are contradicted by the fact that women are generally more daring and less embarrassed than men in exhibiting themselves publically in novel clothes styles. It should also be pointed out that the favorable reactions of the men to their altered images occurred whether these alterations involved becoming taller and thinner or shorter and wider. That is, even though the two classes of alteration were directly opposite in character they both evoked favorable reactions from the men. This appears to be an expression of a diffuse set rather than of a discriminating openness to new body experiences.

GENERAL CONCLUSIONS

A number of categories of sex differentiation in body concept have been ex-

plored. It was intended to demonstrate that in addition to sex differences involving the so-called phallic-nonphallic dimension which has been described there are other differences that are perhaps linked with the cultural roles assigned to the male and female. Evidence has been presented that women have more anxiety and uncertainty about their legs than men, and it was successfully predicted from this fact that their legs would be relatively less activated (in terms of skin resistance level) than those of men. The theory was offered that such leg differences in the body scheme are a function of the fact that women are made to feel that mobility and movement, which are of course closely associated with one's legs, have potentially dangerous consequences.

Data were also presented that indicate a small but consistent tendency for women to experience their body boundaries as more definite and articulated than do men. A possible explanation for this finding was formulated in terms of the idea that the culture spells out clearly for the woman how her body is related to the fulfillment of her principal life goals, whereas the man finds it difficult to associate his body attributes with what is required of him for success and attainment. That is, women have clearer criteria for conceptualizing their bodies as psychological objects. Additional support for this view was offered by findings which demonstrated that men are more disturbed than women when perceiving their mirror images in a situation which introduces conflict as to the sex attributes of their appearance. In still another study it was shown that whereas degree of body awareness in women is linked

with the definiteness of the body image boundary, it seems in men to reflect the prominence of gastrointestinal experiences. This implies that body awareness is a more mature manifestation in the female than in the male. Perhaps this is a function of the fact that it is an expected part of the female's role to focus attention upon her body. For a woman not to be "body aware" is to signal lack of femininity. By contrast, men are expected to be muted in the display and awareness of their bodies. Current standards of mature and successful male behavior do not assign much significance to body awareness, as such.

The studies just reviewed suggest that there exists a spectrum of sex differences in body concept which is related not only to obvious matters of anatomy but also to particular cultural definitions of masculinity and femininity. It is likely that each culture's arbitrary concepts of masculinity-femininity may result in specific sex differences in body image. Thus, in a culture which emphasized female mobility and male passivity there might be a reversal of the present findings which indicate that anxiety about the leg region is greater in women than in men. Or in a setting where masculinity was primarily expressed via display of body strength and agility (e.g., as might be true of a warrior) body awareness in the male might prove not to be related to gastrointestinal sensations but rather to the degree of articulation of his body boundary.

This perspective which relates sex differences in body concept to the values of the culture is a logical derivative of a position outlined elsewhere (Fisher & Cleveland, 1958) which proposes that an individual's body attitudes reflect in body terms the important values and identifications he has evolved. From this view a man's concept of his body size might be significantly influenced by the degree to which he is identified with an inferior depreciated role. Or his degree of awareness of his mouth might be an expression of attitudes he has learned about incorporating. Quite analogously, members of each sex

may adopt specific attitudes toward their bodies which mirror the division of function and status for the sexes typifying their particular culture.

The point should be made that the overall data do not demonstrate a generalized superiority in body concept for men. There has been a tendency in terms of Freud's speculations and Witkin's observations to assume that men display better integration and more effective organization of the body image than do women. However, the present results raise the opposite possibility that in many ways women have less difficulty than men in making psychological sense of their bodies.

It is not farfetched to speculate that the sex differences in body concept which have been discovered may provide useful leads and methods for studying sex-role problems within each sex. There has been little success in finding dependable techniques for measuring degree of masculinity or femininity. It is possible that measures based on body feelings and attitudes are particularly sensitive to the masculinity-femininity dimension. Thus, an evaluation of how an individual regards certain areas of his body or his reactions to the perceptual alteration of his body may prove to be sensitive indicators of the kind of sex role he has learned.

SUMMARY

A series of studies has been presented designed to examine sex differences in body perception and body concept not directly related to phallic-nonphallic distinctions. The following were the principal findings:

1. Men proved to be more receptive than women to the perception of aniseikonically induced alterations in the appearance of their legs. This was supportive of findings reported by Wittreich and Grace and may be interpreted as congruent with the view that women have relatively high anxiety about their legs as a consequence of the negative view taken by the culture toward mobility in space by the female.

2. The demonstration of such a sex difference in aniseikonic perception of

one's legs suggested that women are inclined to minimize the prominence of their legs in the body scheme. This, in turn, resulted in the prediction that females would be characterized by relatively less physiological activation of the legs (in relation to an upper body sector) than would men. The hypothesis was confirmed in adult subjects, but only partially supported in a group of children.

3. Assumptions regarding the superiority of the male to the female in body concept were contradicted by the finding that women obtain significantly higher Barrier, lower Penetration, and higher Barrier minus Penetration scores than men. Women appear to have a more distinct concept of their body boundaries than men.

4. It was further shown that for women the prominence of one's own body in the perceptual field is significantly and positively linked with boundary definiteness, whereas for men it proved to be positively related to degree of awareness of gastrointestinal sensations. These findings indicate that body awareness is a resultant of different variables in men and women and also imply that it is more likely to be as-

sociated with a clearly articulated identity in the latter.

5. The fact that the data did not seem to support the usual suppositions about men having a more clearly defined and stable body concept than women stimulated two other studies of the issue. One demonstrated in two different samples of subjects that men make more errors than women in identifying the sexes of masks worn on their own faces in an ambiguous setting. A second indicated, as predicted, that men were more likely than women to interpret lens-induced changes in the vertical and horizontal axes of their mirror images as improvements upon their actual appearance. The data from these two studies seem to portray women as having a more individuated and meaningful body concept than men.

The overall results indicate that males and females do differ with regard to a number of body-image dimensions which are not directly related to the phallic-nonphallic distinction. In addition, they provide converging lines of evidence which suggest that the female may have a more definite and stable concept of her body than the male.

REFERENCES

BENNETT, D. H. The body concept. *J. ment. Sci.*, 1960, **106**, 56-75.

BLUM, G. A study of the psychoanalytic theory of psychosexual development. *Genet. Psychol. Monogr.*, 1949, **39**, 3-99.

CALDEN, G., LUNDY, R. M., & SCHLAFFER, R. J. Sex differences in body concepts. *J. consult. Psychol.*, 1959, **23**, 378.

CASSELL, W. A., & FISHER, S. Body image boundaries and histamine flare reaction. *Psychosom. Med.*, 1963, **25**, 344-350.

CONQUEST, R. A. An investigation of body image variables in patients with the diagnosis of schizophrenic reaction. Unpublished doctoral dissertation, Western Reserve University, 1963.

DAVIS, A. D. Some physiological correlates of Rorschach body image productions. *J. abnorm. soc. Psychol.*, 1960, **60**, 432-436.

ERIKSEN, E. H. Sex differences in the play configurations of preadolescents. *Amer. J. Orthopsychiat.*, 1951, **21**, 667-692.

FENICHEL, O. *The psychoanalytic theory of neurosis*. New York: Norton, 1945.

FISHER, S. Body image and asymmetry of body reactivity. *J. abnorm. soc. Psychol.*, 1958, **57**, 292-298.

FISHER, S. Body image and upper in relation to lower body sector reactivity. *Psychosom. Med.*, 1961, **23**, 400-402. (a)

FISHER, S. Front-back differentiations in body image and body reactivity. *J. gen. Psychol.*, 1961, **64**, 373-379. (b)

FISHER, S. Body image boundaries and hallucinations. In J. West (Ed.), *Hallucinations*. New York: Grune & Stratton, 1962.

FISHER, S. A further appraisal of the body boundary concept. *J. consult. Psychol.*, 1963, **27**, 62-74.

FISHER, S. Body awareness and relative memory for body versus non-body references. *J. Pers.*, 1964, **32**, 138-144.

FISHER, S., & CLEVELAND, S. E. *Body image and*

personality. Princeton, N. J.: Van Nostrand, 1958.

FISHER, S., & FISHER, RHODA. Body image boundaries and patterns of body perception. *J. abnorm. soc. Psychol.*, 1964, **68**, 255-262.

FRANCK, K., & ROSEN, E. A projective test of masculinity-femininity. *J. consult. Psychol.*, 1949, **13**, 247-256.

FREUD, S. Three contributions to the theory of sex. In, *The basic writings of Sigmund Freud*. New York: Random House, 1938.

FREUD, S. Some psychological consequences of the anatomical distinction between the sexes. In, *Collected papers*. New York: Basic Books, 1959.

HARLOW, R. G. Masculine inadequacy and compensatory development of physique. *J. Pers.*, 1951, **19**, 312-323.

JOURARD, S. M., & SECORD, P. F. Body cathexis and the ideal female figure. *J. abnorm. soc. Psychol.*, 1955, **50**, 243-246.

KATCHER, A., & LEVIN, M. M. Children's conceptions of body size. *Child. Develpm.*, 1955, **26**, 103-110.

MACHOVER, K. Human figure drawings of children. *J. proj. Tech.*, 1953, **17**, 85-91.

PARSONS, T., & BALES, R. F. *Family socialization and interaction process*. Glencoe, Ill.: Free Press, 1955.

REITMAN, E. E., & CLEVELAND, S. E. Changes in body image following sensory deprivation in schizophrenic and control groups. *J. abnorm. soc. Psychol.*, 1964, **68**, 168-176.

SCHILDER, P. *The image and appearance of the human body*. London: Kegan Paul, Trench, Trubner, 1935.

SECORD, P. F. Objectification of word-association procedures by the use of homonyms: A measure of body cathexis. *J. Pers.*, 1953, **21**, 479-495.

SHIPMAN, W. G., OKEN, D., GRINKER, R. R., GOLDSTEIN, I. B., & HEATH, H. A. A study in the psychophysiology of muscle tension. II: Emotional factors. *Arch. gen. Psychiat.*, in press.

SWENSON, C. H., & NEWTON, K. R. The development of sexual differentiation on the Draw-A-Person Test. *J. clin. Psychol.*, 1955, **11**, 417-419.

VAN LENNEP, D. J. Projection and personality. In H. P. David, & E. Von Bracken (Eds.), *Perspectives in personality theory*. New York: Basic Books, 1957.

WAPNER, S., WERNER, H., & COMALLI, P. E., JR., Effect of enhancement of head boundary on head size and shape. *Percept. mot. Skills*, 1958, **8**, 319-325.

WEINBERG, J. R. A further investigation of body cathexis and the self. *J. consult. Psychol.*, 1960, **24**, 277.

WIEDER, A., & NOLLER, P. A. Objective studies of children's drawings of human figures. I: Sex awareness and socioeconomic level. *J. clin. Psychol.*, 1950, **6**, 319-325.

WIEDER, A., & NOLLER, P. A. Objective studies of children's drawings of human figures. II: Sex, age, and IQ. *J. clin. Psychol.*, 1953, **9**, 20-23.

WITKIN, H. A., LEWIS, H. B., HERTZMAN, M., MACHOVER, K., MEISSNER, P. B., & WAPNER, S. *Personality through perception*. New York: Harper, 1954.

WITTREICH, W. J., & GRACE, M. Body image and development. Technical Report, March 29, 1955, Princeton University, Contract N6 ONR-270(14), Office of Naval Research.

WITTREICH, W. J., & RADCLIFFE, K. B., JR. The influence of simulated mutilation upon the perception of the human figure. *J. abnorm. soc. Psychol.*, 1955, **51**, 493-495.

(Received April 30, 1964)

